School of:  Arts and Sciences  
Prepared by:  Committee  
IAI Code:  M1901

Department:  Mathematics

Date (prepared for CCC):  10/2/2012

Major Curriculum or market served:  A variety of Liberal Arts majors

Next Annual Review Date:  Fall 2014

Course Data:

<table>
<thead>
<tr>
<th>Prefix No.</th>
<th>Course Title</th>
<th>Credit</th>
<th>Lecture</th>
<th>Lab</th>
<th>Clinical Lab</th>
<th>*Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 101</td>
<td>Quantitative Literacy</td>
<td>3.0</td>
<td>3.0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

Prerequisite(s):

Writing:  Assessment test score of 4 or higher; an English ACT score of 20 or higher; or a grade of "C" or better in RHT 095 or RHT 096 or completion of RHT 101

AND
Reading:  Assessment test score of 4 or higher; a Reading ACT score of 20 or higher; or a grade of "C" or better in RHT 085 or RHT 086 or completion of RHT 101

AND
Intermediate Algebra and Geometry demonstrable through a minimum Triton placement score of 6 or ACT Math score of 23 (within the last two years) or MAT 085 or MAT 096 or MAT 103.

A grade of "C" or better is required for all prerequisite math courses.

Catalog Course Description:  Intended for students in areas of study not requiring calculus or advanced mathematics. Applications of ratio and measurement to real-world situations, including percentages, linear and exponential modeling with a focus on environmental applications, and basic descriptive statistics.

I. Overall Learning Goals (1 or 2 sentences):

Upon successful completion of this course, the student will be able to reason about quantities, their magnitudes and their relationships between and among other quantities. Students will also develop competency in problem solving and analysis helpful to decision-making needed by an educated citizen of the 21st century.

*List course fee amount for new courses only. List ‘None’ if course fee not required. List ‘Yes’ if course fee is required for revised course.
II. Resources utilized:
(In any standard citation format (APA, MLA, Chicago, etc. Refer to the Curriculum Handbook for examples.)

A. Required textbook(s)/workbook(s)


B. Supplementary texts/and materials:

C. Other resources utilized: MyMathLab

III. Instructional Strategies: Check and comment as needed on the instructional methods utilized to attain the course objectives. (HINT: To check a box, double-click on it and mark “checked”)

- Lecture
- Lecture/Demonstration
- Clinical lab
- Internship
- Discussion
- Laboratory
- Independent study
- Power Point
- Podcasting
- Social media
- Internet resources
- Problem solving(case situations)

Other:

Comment on instructional methods utilized (optional):

IV. Formative Assessment: Check the evaluation methods utilized to monitor progress toward attainment of course objectives.

- Quizzes
- Examinations
- Journal
- On-line discussion forums
- Pre-/post-test/paper
- Laboratory skills
- Oral participation
- Written assignments
- Clinical progress reports
- Coop experience Progress report

Other:

V. Summative Assessment: Check the evaluation method utilized to determine whether final course objectives have been attained.

- Final (written) examination
- Final (oral) examination
- Final clinical/laboratory exam
- Final skills test
- Final coop experience evaluation
- License/certification exam results
- Mid-term examination
- Common writing assessment

Other:

VI. Indirect Assessment: Check the assessment method(s) utilized to determine if the learning goals and objectives have been attained.

- One-minute paper
- Student survey
- Journal assignment/blog
- Employer survey

Revised 5/3/2012
VI. **Course Plan**: Indicate the distribution of contact hours by topic.

- Lecture hours should not exceed 6 hours per topic
- Lab hours should not exceed 8 hours per topic
- Final exam time is above and beyond the course contact hours and should not be included as a topic

### TOPICAL OUTLINE

<table>
<thead>
<tr>
<th>Topic</th>
<th>Contact Hours</th>
<th>Clinical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lecture</td>
<td>Laboratory</td>
</tr>
<tr>
<td>Accuracy and Precision of Measurement</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Units of Measurement</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Unit Conversion</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Compound Units</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Scientific Notation</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Logarithmic Scales</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Use and Abuse of Percentages and Applications</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Numbers in Perspective</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Dealing with Uncertainty in Numbers in the Real World</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Index Numbers – The Consumer Price Index</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ratio and Percentages – Normalization, Parts per Million, Parts per Billion</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ratio and Percentages – Percentage Change and Percentage Error</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>The Building Blocks of Mathematical Models</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Linear Function Modeling - Overview</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Dependent versus Independent Variables</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Approximating Almost-linear Data Sets</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>The Correlation Coefficient</td>
<td>1</td>
<td></td>
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<tr>
<td>Correlation Fallacies</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Linear versus Exponential Functions</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Exponential Function Modeling - Overview</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Exponential Rates and Multipliers</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
### Solving Exponential Equations
- 2

### Doubling time and Half-lives
- 2

### Approximating Almost Exponential Data Sets
- 1

### Fundamentals of Statistics
- 1

### Measures of Center
- 1

### Quartiles, 5-number Summary & Box Plots
- 1

### Shape of a data set
- 1

### Comparing mean and median
- 1

### Sampling
- 1

**TOTAL**
- 45

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VIII. **Learning Objectives:** For courses approved by ICCB, it is presumed students will spend additional study time in order to meet the following objectives:

- a minimum of 2 hours outside study for each 1 hour of lecture in class
- a minimum of 1 hour of outside study for each 2 hours of lab or clinical in class
- every topic must have an objective
- learning objectives must be stated in *demonstrable and measurable* terms (see Curriculum Handbook for examples)
- indicate ‘Lecture’ and/or ‘Lab’ by inserting an ‘X’ in the appropriate column(s).

<table>
<thead>
<tr>
<th>Objective</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>Clinical/Laboratory</th>
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</thead>
<tbody>
<tr>
<td>Demonstrate an understanding of measurement and estimation as applied to environmental measurement situations. More specifically, students will demonstrate the ability to measure accurately using appropriate units, convert units of measure, and use scientific notation and logarithmic scale as appropriate for various real life situations involving measurement.</td>
<td>X</td>
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<tr>
<td>Recognize percentages that have been used appropriately in real world situations (versus those that have been used to manipulate the audience).</td>
<td>X</td>
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<tr>
<td>Describe and analyze and determine the mathematically correct response to real-life situations involving uncertainty in numbers.</td>
<td>X</td>
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<tr>
<td>Demonstrate an understanding of number perspective by estimating and comparing values of varying magnitudes. In particular, students will demonstrate understanding of how the consumer price index is calculated and how it relates to inflation percentage.</td>
<td>x</td>
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<tr>
<td>Demonstrate an understanding of the power of normalization for comparing environmental data sets.</td>
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<td></td>
</tr>
</tbody>
</table>

Revised 5/3/2012
| Demonstrate understanding of the significance of percentage error as related to data reporting. | X  |
| Demonstrate knowledge of the fundamental characteristics of a mathematical model and the ability to apply the appropriate model to a given real-life scenario. In particular, students will demonstrate the ability to determine the independent and dependent variable for a data set that represents a real-life scenario with environmental implications. | X  |
| Apply linear modeling appropriately to obtain solutions and will be able to correctly interpret findings. In particular; students will be able to compare and analyze correlation coefficients for linear data and identify situations in which correlation fallacies exist. | X  |
| Assess whether data can be represented with a linear or exponential model in cases where the data is clearly linear or exponential as well as in cases where the data is approximately linear or approximately exponential. | X  |
| Apply exponential modeling appropriately to obtain solutions to real-life problems and will be able to correctly interpret findings. In finding solutions, students will demonstrate the ability to solve exponential equations and create doubling time and half-life models. | X  |
| Describe data graphically and numerically. Students will use the visual tools of the box and whisker plot and the shape of data graphs along with five number summary and measures of center as part of their analysis of real-life data sets. | X  |
| Analyze data using the tools of elementary statistics. In particular; students will select the appropriate sampling method for the set of data they are studying. In addition, students will be able to compare various numerical measurements (e.g. mean and median) to draw conclusions about data especially conclusions that have environmental implications. | X  |